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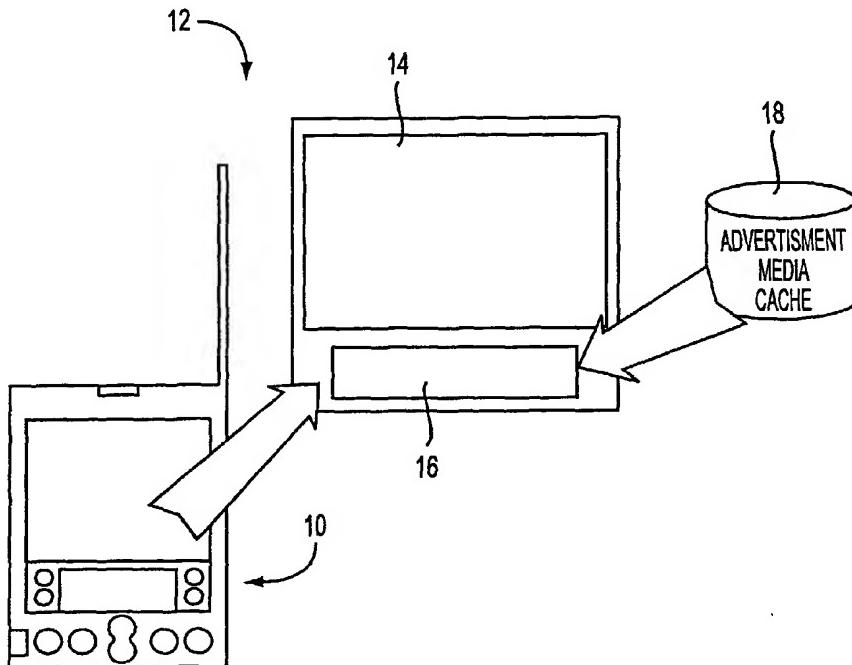
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(54) Title: FLEXIBLE WIRELESS ADVERTISEMENT INTEGRATION IN WIRELESS SOFTWARE APPLICATIONS



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(57) Abstract: An advertising architecture is provided that allows advertisements to be tailored for different wireless device types and minimizes transmitted information while maintaining the functionality of Banner Ads (12).



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**FLEXIBLE WIRELESS ADVERTISEMENT  
INTEGRATION IN WIRELESS SOFTWARE APPLICATIONS**

**PRIORITY**

5       The following application claims priority from U. S. Provisional Patent Application Serial No. 60/185,749, filed February 29, 2000, the disclosure of which is incorporated herein by reference.

**FIELD OF THE INVENTION**

10      The present invention relates to wireless software applications. More particularly, the present invention relates to advertising applications for use in wireless software applications.

**BACKGROUND OF THE INVENTION**

15      The World Wide Web has proven that online advertisement can provide a viable source of revenue for electronic application and content providers. The most common form this advertisement takes is what is commonly known as a Banner Ad. A banner ad is a component of a web page that is typically made up of a multimedia component that conveys information  
20      about the product or service being advertised, as well as a hyperlink to more information or a web site where the product or service can be purchased.

     Moving Banner Ads into the wireless or mobile device realm has proven to be challenging for a number of reasons. One such reason is that wireless and mobile devices typically have constrained, limited, and heterogeneous device

display capabilities. The bandwidth available for transmission over different wireless networks also places different constraints on the media that can be transmitted to the wireless devices. Thus, the same Banner Ad would not be appropriate for all wireless devices.

5        In addition, wireless devices typically have more limited interaction mechanisms and thus it may not be possible to navigate a Banner Ad in the same way on all devices. Furthermore, the higher cost of wireless bandwidth requires a focus on minimizing the data required for the Banner Ad in order to reduce the transmission time and the consequent cost.

10      A need therefore exists for an advertising architecture that allows advertisements to be tailored for different wireless device types and minimizes transmitted information while maintaining the functionality of Banner Ads.

#### SUMMARY OF THE INVENTION

15      The present invention satisfies the foregoing needs by providing, in one aspect, an advertising architecture which includes a wireless data reception and display device. A memory cache is provided in the wireless data device to store data relating to advertisements to be displayed on the wireless data device.

20      In another aspect, a method of delivering advertisement content to a wireless device is provided wherein a data file including data representative of an advertisement and usage rules is generated. The data file is stored in

memory on the wireless device and the advertisement is displayed on the wireless device in accordance with the rules for displaying the advertisement.

In yet another aspect of the invention, a method of managing advertising content in a wireless environment is provided wherein a  
5 transmission is received from a wireless device at a ~~wireless~~ server. Information about the wireless device is determined from the transmission and a data file to be transmitted to the wireless device is selected based upon the information determined about the wireless device. The data file is then transmitted to the wireless device. The data file includes data representative of  
10 an advertisement and rules for displaying said advertisement.

There has thus been outlined, rather broadly, the more important features of the invention in order that the detailed description thereof that follows may be better understood, and in order that the present contribution to the art may be better appreciated. There are, of course, additional features of  
15 the invention that will be described below and which will form the subject matter of the claims appended hereto.

In this respect, before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and to the arrangements of the  
20 components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the

phraseology and terminology employed herein, as well as the abstract, are for the purpose of description and should not be regarded as limiting.

As such, those skilled in the art will appreciate that the conception upon which this disclosure is based may readily be utilized as a basis for the 5 designing of other structures, methods and systems for carrying out the several purposes of the present invention. It is important, therefore, that the claims be regarded as including such equivalent constructions insofar as they do not depart from the spirit and scope of the present invention.

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#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an illustration of a wireless PDA, the display screen with a banner advertisement, and an advertising data cache of a preferred embodiment of the present invention.

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FIG. 2 is an illustration of a wireless PDA system in accordance with a preferred embodiment of the present invention.

FIG. 3 is an illustration of the advertising data management scheme of a preferred embodiment of the present invention.

FIG. 4 is a screen shot of a wireless PDA including a text and media advertisement.

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FIG. 5 is a screen shot of a wireless PDA including a text only advertisement.

FIG. 6 is an illustration of the operation of the advertising architecture of a preferred embodiment of the present invention.

DETAILED DESCRIPTION OF PREFERREDEMBODIMENTS OF THE INVENTION

Referring now to the figures wherein like reference numerals indicate  
5 like elements, in FIG. 1 there is illustrated a wireless personal digital assistant  
(PDA) device with the user interface screen 12 expanded for clarity. Also  
depicted is a memory cache of the PDA 18 for storing advertising media and  
display rules for advertisements to be displayed on the PDA user interface  
screen 12. While discussed herein in the context of a wireless PDA, it should  
10 be understood that the advertising architecture to be described herein would be  
equally applicable on any wireless web access device.

The user interface screen is divided into two sections, the first being  
the wireless application portion 14 for retrieving both data and actions from a  
wireless server. The second portion of the user interface screen is the Banner  
15 Advertisement portion 16. The location and timing of the display of an  
advertisement on the PDA is determined by meta-information stored along  
with the advertising media as part of a data file (Advert Bundle) in a data  
cache 18 within the PDA device. A detailed discussion of the contents of the  
Advert Bundle will be provided below.

20 As shown in FIG. 2, a wireless PDA system supporting the advertising  
architecture of the present invention includes the wireless PDA 10  
communicating with a wireless application server 20 over a wireless network  
22. A wireless modem or communication hardware that support commercial

wireless data network (i.e. Mobitex, DataTac, GSM, CDPD, CDM, GPRS, W-CDMA) (not shown) is also necessary. There are number of vendors for both the hardware and software which power the foregoing system components.

For example, the advertising architecture of the present invention can 5 support any PDA device running the Palm Operating System®(i.e. PalmIII, PalmV, PalmVII, Sony Clie, Kyocera SmartPhone), the Research In Motion's RIM Operating System, and Microsoft's PocketPC Operating System. In addition, this architecture can support any device that can host a Java 2 MicroEdition Virtual Machine or is supported by Qualcomm's Binary 10 Runtime Environment for Wireless (BREW) Technology. It should be noted that the foregoing list is merely exemplary and is not intended to be limiting.

Similarly, a variety of wireless application servers 20 exist on the market today which are capable of supporting the advertising application of the present invention. These servers should support data consisting of content, 15 media, and application logic. The server is generally run on hardware running the Solaris, Linux, Windows NT, or Windows 2000 operating systems. The server must also have a TCP/IP network connection and be accessible from a wireless gateway server. The wireless gateway translates wireless data requests and responses into TCP/IP requests and responses.

20 In a preferred embodiment of the invention, the wireless application server is the ThinAir Server provided by ThinAirApps, Inc., New York, New York. Other exemplary servers that may be used in the architecture of the

present invention include the Lutris Enyhdra, Nokia WAP Gateway, and Microsoft's Mobile Information Server.

A device is also necessary to support third-party applications via a fully programmable operating system, or a microbrowser supporting the

5 Wireless Markup Language (WML), the Hypertext Markup Language (HTML), the Handheld Device Markup Language (HDML), or Compact HTML (CHTML). The device may optionally support the ability to cache data locally for reference and reuse at a later point.

A wireless data service is also necessary to enable communication  
10 between the application server and device. This service is enabled by wireless modem hardware which must be used in conjunction with the device. The modem is usually embedded within the device, or attached to an external piece of hardware.

The wireless PDA system of FIG. 2 also includes an advertising media store 24 on the wireless server 20. This wireless media store 24 stores Advert Bundles to be provided to the PDA cache 18 for display on the user interface screen. The Advert Bundles can be provided to the PDA cache 18 in any way which limits or eliminates the need for high bandwidth wireless data transfer. For example, the PDA cache can be updated by the user exchanging a cache  
20 data card on the PDA.

The cache could also be updated by utilizing the user's personal computer as a conduit for the transmission of the data. Updated Advert Bundles can be provided to the user's desktop personal computer so that the

PDA would be updated during synchronization of the PDA to the desktop personal computer.

Additionally, the PDA cache could be updated by wireless transactions during “down” cycles or via push mechanisms. While requiring wireless 5 transmission of the Advert Bundles, significantly less bandwidth is required than would be the case if the advertisements were being transmitted for display in real time.

An illustration of the Advert Bundle management scheme of the wireless server is depicted in FIG. 3. The advertising media store 24 stores 10 the Advert Bundles 26 for the advertisements of parties interested in providing advertising to user's of the PDA's. The Advert Bundles are used to store advertising data on the user's PDA for use by a variety of applications. Any number of bundles may be stored on the device, being only limited by the amount of storage the device has.

15 Each Advert Bundle 26 includes the media to be displayed 28. The media to be displayed 28 being a small footprint digital image file specifically sized for the type of PDA or other wireless device on which the advertisement is to be displayed. The Advert Bundle 26 also includes a text only version of the advertisement 30 to be used where no media is supplied or where the 20 device is incapable of displaying the media.

In addition, the Advert Bundle 26 also includes any hypertext links 32 specifying locations where more information about the subject of the advertisement is available. This link 32 can be in the form of an HTTP

Uniform Resource Locator (URL), or a pointer to another local application on the mobile device. Further, each Advert Bundle 26 includes usage rules 34 which is the control data determining how often, when, and where to display the advertisement.

5 It should be readily understood that, through use of the Advert Bundles 26, the data required to be transmitted wirelessly to display advertisements on a wireless device can be significantly reduced or eliminated. It should also be understood that the Advert Bundles, while a logical grouping of information, can be distributed between both the client and server. For instance, the media 10 portion 28 of the bundle 26 may be stored on the user device, while the text 30 and link 32 could be sent each time from the server 20. This allows for greater flexibility and easier management of the Advert Bundles 26.

The wireless devices that the advertising architecture of the present invention is addressing are constrained and limited in their display capabilities. 15 Along with that, the known, shared characteristics of wireless devices tend to vary widely in their actual embodiment. Some examples of these varying characteristics include screen size, bit depth, support for color, input mechanism, e.g., stylus, keyboard, phone pad, voice, and supported data services.

20 As advertising is focused on delivering an inviting experience to the viewer, these issues must be handled by any advertising scheme involving the display of media on a wireless device. The advertising architecture of the present invention supports identification of devices and metadata about their

characteristics. As depicted in FIG. 3, this profiling mechanism can be used to modify the data in an Advert Bundle before delivery to a wireless device.

In operation, a request from a device for an update of the Advert Bundles will be received at the server 20. A profiling operation 36 will then 5 be performed to determine the type of device submitting the request. A location determining operation 38 is also performed to determine the location of the wireless device. Based upon the profiling operation 36, an Advert Bundle Management application 40 will select the Advert Bundles appropriate for the device.

10           Based upon the location determining operation 38, the Advert Bundles 26 selected by the Advert Bundle Management application 40 may be further filtered to select only those appropriate for the identified location. The Advert Bundles are then delivered 44 to the user device using a delivery mechanism as described above.

15           Another important variable with wireless devices is which Data Services are supported by the device. For instance, most mobile handsets support the Wireless Application Protocol (WAP), which uses an HTTP “browser” type transport to deliver data. However, they also support the Short Message Service (SMS) for push or instant message-type transactions. This 20 information would be determined during the profiling operation 36 and the Advert Bundles selected by the Advert Bundle Management application 40 would be appropriate for the device.

With respect to the location data, many wireless devices have or will have the capability of determining the current geographical location of the user. Palm, Inc.'s PalmVII and PalmVIIx both allow application developers to determine the current location of the user down to the zip code. It should be 5 understood that the advertising architecture of the present invention does not provide the location data. Instead, this data is provided by the wireless devices and may be different for different devices.

As part of the device profiling capabilities location data can be accessed as available by specific devices. This data can be used to filter which 10 Advert Bundles get delivered to which users. This feature is extremely important for context-based filtering of data including advertisements. For instance, if a Palm user is using an application in Manhattan, advertisements may be targeted to goods or services provided in Manhattan.

In FIG. 4 there is shown a typical application of the present invention 15 where, in the screen shot depicted, an e-mail application is displayed in the user interface portion 46 of the PDA. In the advertisement portion a text and media advertisement 48 is displayed along with a hyperlink connection 50 to the advertiser's web page. Advertisements may also be provided in other formats, as shown in FIG. 5 wherein only text is provided in the advertisement 20 52.

Further, the Advert Bundles can direct that advertisements be displayed in different locations on the user interface screen in different sizes. For example, in the system of the present invention, it is contemplated that

advertisements would be displayed in the e-mail inbox header view, at the bottom of each full e-mail message and at the bottom of each e-mail composition screen.

Each time the user navigates to one of these screens, the Advert Bundle 5 changes to a new one. In the presently preferred embodiment, there are a total of five Advert Bundles. The server side of the application controls the Usage Rules 34, controlling which Advert Bundles are displayed when, to which users, and potentially filtering based on the user's current zip code.

In this presently preferred embodiment, the Advert Bundles can be 10 updated by modifying a Palm Query Application database record on the PalmVII device. This record stores the bundles separately from the main application interface, and can be updated over the PalmVII's wireless connection.

User's of wireless devices for such applications as e-mail may be 15 provided with the option of receiving or refusing to receive advertisements. Incentives, such as free e-mail service, etc., may be provided to user's electing to receive the advertisements while user's refusing to receive the advertisements would pay for these services. Once electing to receive advertisements, the timing, selection, and display of the advertisements would 20 be controlled.

As shown if FIG. 6, an advertiser 54 forwards a request to the wireless server provider 56 that an advertisement be created for the advertisers goods or services and be provided to wireless data users 56. In the system depicted,

the user 58 is utilizing a text pager 60 which communicates with the wireless server 56 over a suitable communication network 62.

It should be understood that the request for creation of the advertisement does not need to be transmitted over the web to the server provider 56. It is also contemplated that advertisers utilizing the advertising architecture of the present invention will develop their own Advert Bundle to be transmitted to the server provider 56 for ultimate transmission to users 58.

It can be readily understood from the foregoing description that the advertising architecture of the present invention provides a way for media content to be specifically targeted and tailored for each device type, making use of specific capabilities of the devices. The architecture also efficiently utilizes bandwidth by transmitting only essential information over the wireless network to communicate which advertisements to display, when to display them, and geographically where to display them.

The architecture also provides a framework for delivering extra textual information about the advertisement, along with “click-through” hyper linking to both local, on the device applications and remote web-based content.

This architecture moves much of the logic of web-based advertising solutions onto the user device itself. Personal Digital Assistants such as the Palm or PocketPC are more than capable of supporting this type of processing and logic. In the near future, mobile phones will also have this capability through technologies such as Sun’s Java 2 MicroEdition (J2ME) and Qualcomm’s BREW.

The above description and drawings are only illustrative of preferred embodiments which achieve the objects, features, and advantages of the present invention, and it is not intended that the present invention be limited thereto. Any modification of the present invention which comes within the 5 spirit and scope of the following claims is considered to be part of the present invention.

What is claimed is:

1. An advertising architecture, comprising:
  - a wireless data reception and display device;
  - a memory cache provided in said wireless data device;
  - wherein said memory cache stores data relating to advertisements to be displayed on said wireless data device.
2. The advertising architecture of claim 1, wherein said wireless data device is a web enabled device.
- 10 3. The advertising architecture of claim 1, wherein said data relating to advertisements includes the media and hypertext links to be included in the advertisements to be displayed on the wireless data device.
- 15 4. The advertising architecture of claim 3, wherein said data relating to advertisements also includes rules for displaying said advertisement.
5. The advertising architecture of claim 1 wherein said wireless device also contains a synchronization port for synchronizing said wireless device with a personal computer; and  
20 wherein said data relating to advertisements to be displayed on said wireless data device is stored in said memory cache during synchronization of said wireless device with said personal computer.

6. The advertising architecture of claim 5 wherein said memory cache is a compact flash card.
7. The advertising architecture of claim 6 wherein said data relating to advertisements includes the media and hypertext links to be included in the 5 advertisements to be displayed on the wireless data device and also includes rules for displaying said advertisement.
8. The advertising architecture of claim 2, wherein said data cache stores data including the text of an advertisement to be displayed on the wireless data 10 device.
9. A method of delivering advertisement content to a wireless device, comprising the steps of:
  - generating a data file including data representative of an advertisement
  - 15 and usage rules;
  - storing the data file in memory of said wireless device;
  - displaying said advertisement on said wireless device in accordance with said rules for displaying said advertisement.
- 20 10. The method of claim 9, wherein said storing step is accomplished by the steps of:
  - transmitting said data file from a wireless server to a desktop computer; and

storing the data file in said memory of said wireless device during synchronization of said wireless device to said personal computer.

12. The method of claim 11, wherein the data representative of the advertisement is advertising media.
- 5
13. The method of claim 12, wherein the data file also contains a hypertext link.
- 10 14. The method of claim 9 wherein said storing step is accomplished by the steps of:
  - storing said data file in a replaceable memory cache;
  - installing said replaceable memory cache in to said wireless device.
- 15 15. A method of managing advertising content in a wireless environment, comprising the steps of:
  - receiving a transmission from a wireless device at a wireless server;
  - determining information about said wireless device from said transmission;
  - 20 selecting a data file to be transmitted to said wireless device based upon said information determined about said wireless device;
  - transmitting said data file to said wireless device; and

wherein said data file includes data representative of an advertisement and rules for displaying said advertisement.

16. The method of claim 15, wherein said information determined from  
5 said transmission from said wireless device includes the type of wireless  
device.

17. The method of claim 16, wherein said information determined from  
said transmission from said wireless device also includes a profile of the  
10 device, said profile including the data services supported by said device.

18. The method of claim 17, wherein said data file includes advertising  
media.

15 19. The method of claim 15, wherein said information determined from  
said transmission from said wireless device includes the location of said  
device.

20. The method of claim 20, wherein said rules for displaying the  
advertisement determine whether to display the advertisement based upon said  
location information.

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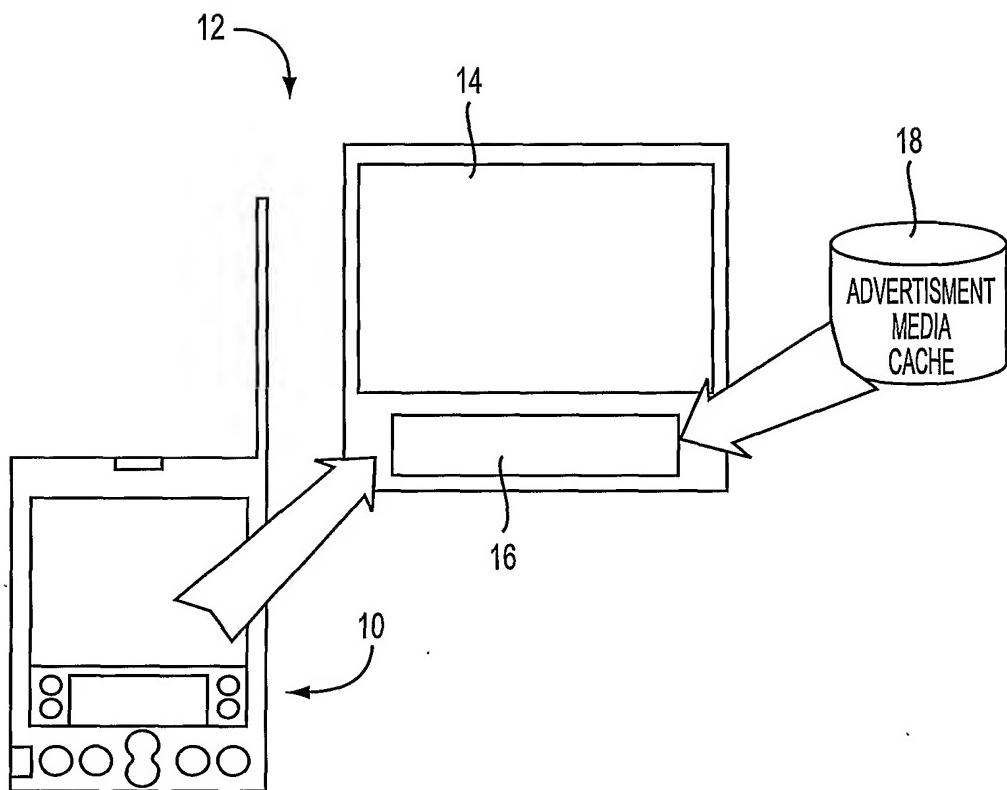


FIG. 1

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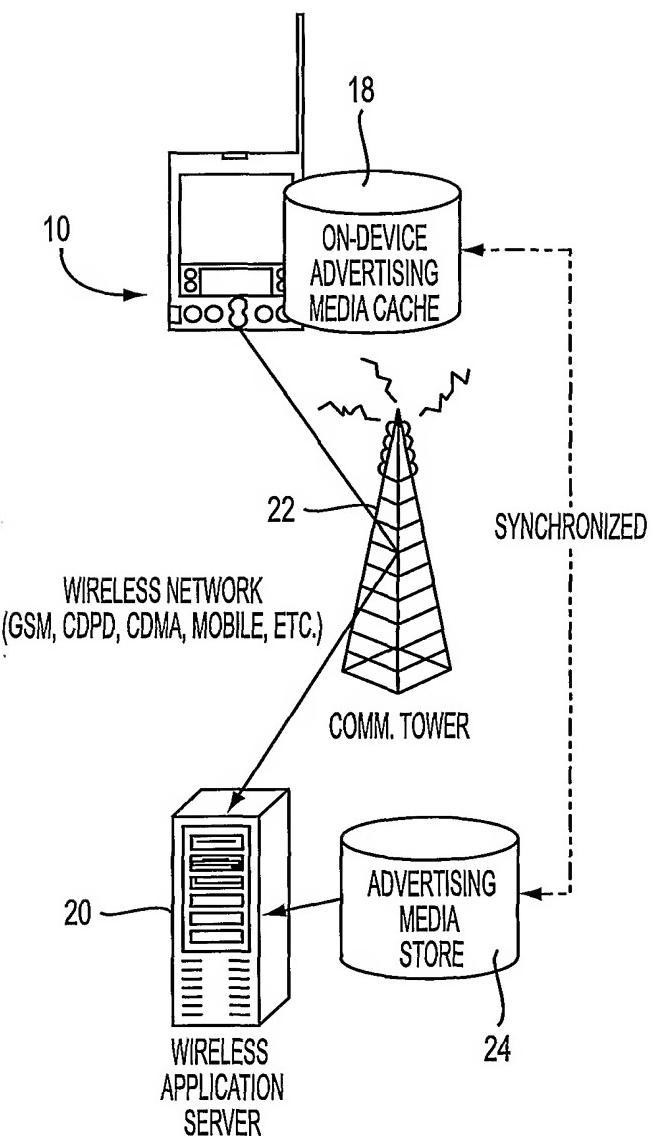


FIG. 2

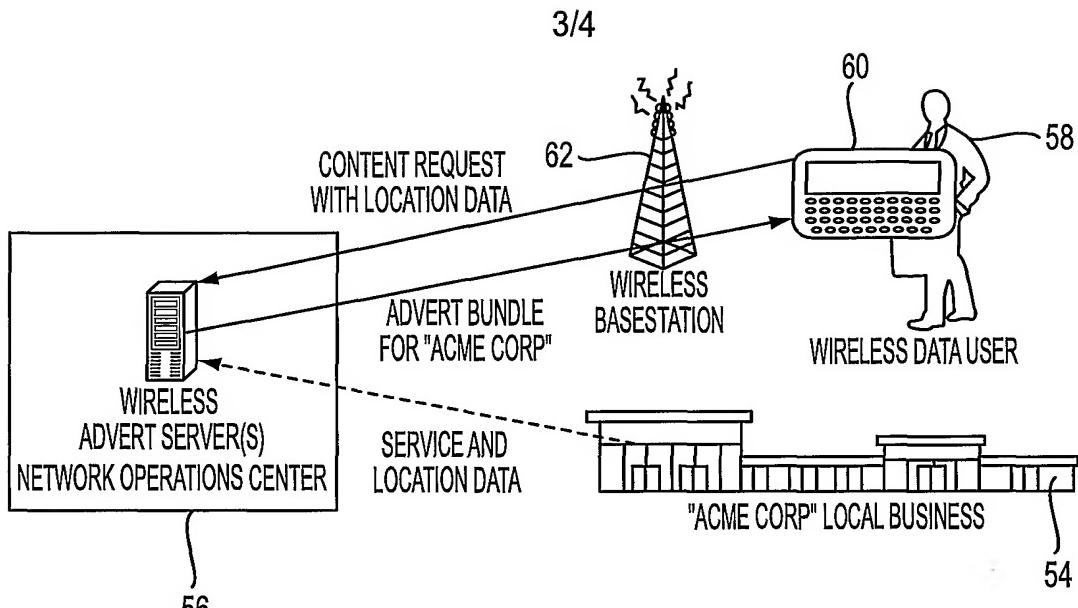


FIG. 6

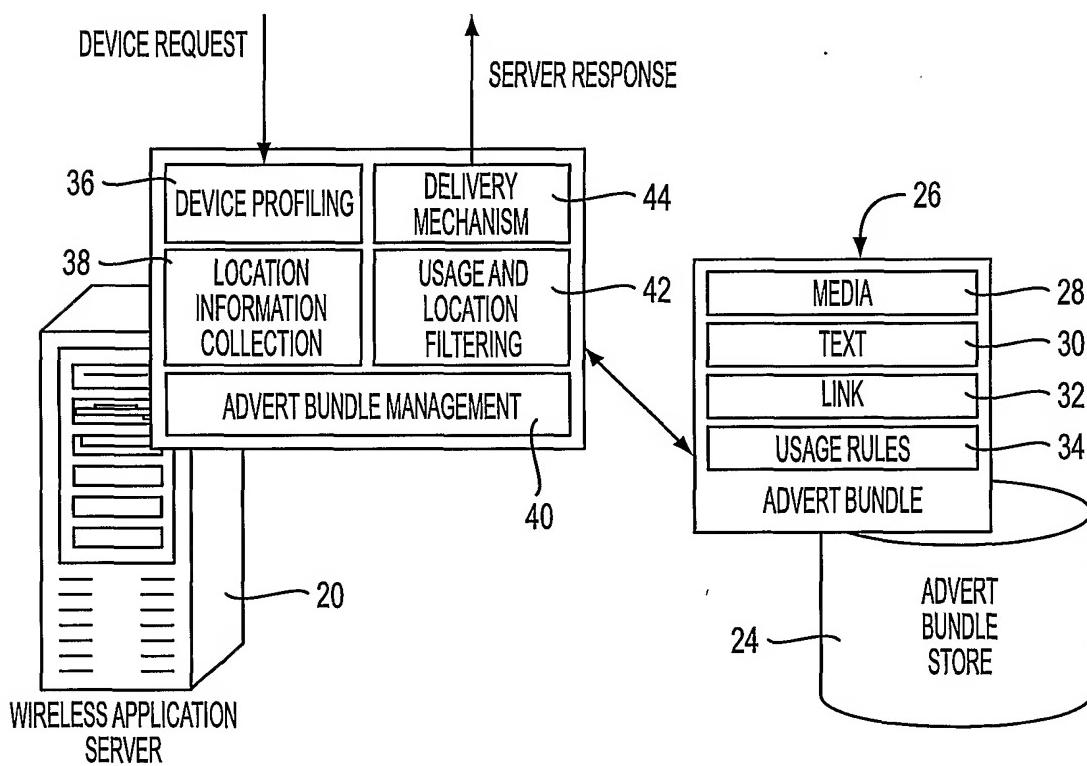


FIG. 3

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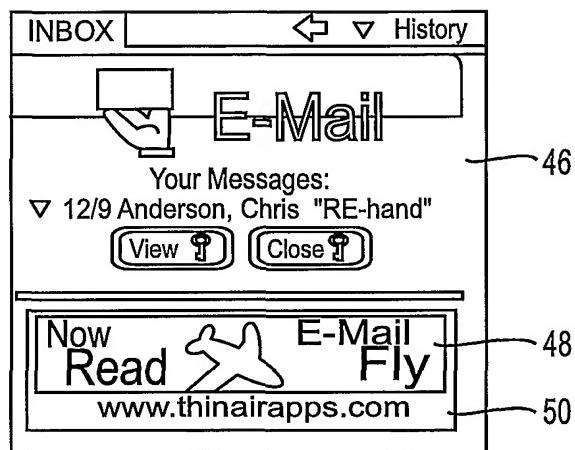


FIG. 4

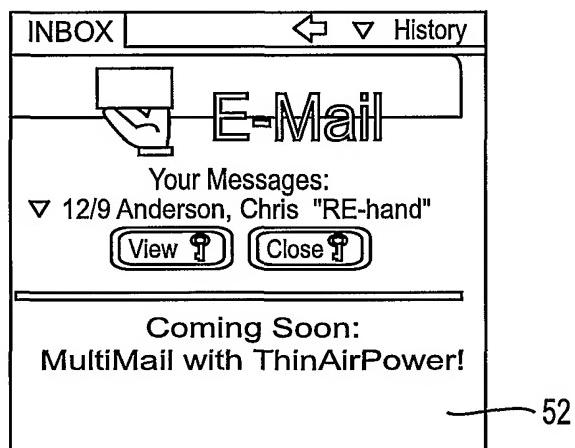


FIG. 5

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/06340

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06F 17/30  
US CL : 707/8 102, 104, 705/1 26, 27, 355/31.1

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 707/8, 104, 705/1 26, 27,

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
EAST

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	US, 6,157,814 A (HYMEL ET AL) 05 DECEMBER 2000, FIG.2, COL. 2-3	1-4, 7-9, 11-12, 14, 17-20
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Y		5-6, 10, 13, 15-16
Y,E	US, 6,216,112 B1 (FULLER ET AL) 10 APRIL 2001, FIG. 2-3, COL. 8-10, LINES 21-7.	5-6, 10, 13, 15-16
A	US, 6,009,409 A (ADLER ET AL) 28 DECEMBER 1999, SEE ENTIRE PATENT	1-19

Further documents are listed in the continuation of Box C.  See patent family annex.

* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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24 April 2001 (24.04.2001)

Date of mailing of the international search report

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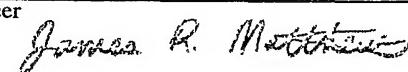
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